Chronic Wasting Disease (CWD) Data Integration

The node will provide data, information, and links to Chronic Wasting Disease (CWD) and other wildlife disease information.

Background on the NBII

The National Biological Information Infrastructure (NBII) <www.nbii.gov> is an electronic information network that provides access to biological data and information on our nation's plants, animals, and ecosystems. Information contributed by federal, state, and local government agencies; non-government organizations; and private-sector organizations is linked through the NBII gateway and made accessible to a variety of audiences, including researchers, natural resource managers, decision-makers, educators, students, and other members of the general public. Implementation of the NBII is being accomplished through the development of nodes that serve as entry points to the network. These nodes function as fully digital, distributed, and interactive systems that focus on content on a defined subject area or a geographic region. The NBII Wildlife Disease Information Node (WDIN) will address the need for information on a variety of disease agents in wildlife and their implications, including those affecting domestic animals and humans.

Background on CWD

CWD is one of the diseases known as transmissible spongiform encephalopathies (TSEs). TSEs include diseases such as scrapie in sheep, bovine spongiform encephalopathy (BSE) in cattle (aka, mad cow disease), and Creutzfeldt-Jakob disease of humans. TSEs are diseases

Infected mule deer with CWD

Photo credit: Christina Sigurdson, Colorado State University. Photo taken at Colorado Division of Wildlife Research Facility.

of the nervous system that result in distinctive lesions in the brain and are believed to be caused by a modified protein (prion). CWD affects elk, white-tailed deer, and mule deer in a limited number of areas in North America, and is not known to affect livestock or humans. Deer and elk can appear robust and healthy in the early stages of infection and may take two or more years before they show clinical signs of the disease, after which the disease is fatal. Testing for CWD infection in large numbers of deer and elk currently relies on detection of the CWD agent in lymphoid tissues and/or a specific portion of the brainstem collected after death. In deer, prions also accumulate in lymphoid tissue, which may also be tested to detect the early stages of infection.

CWD Data Integration and Information Management Needs

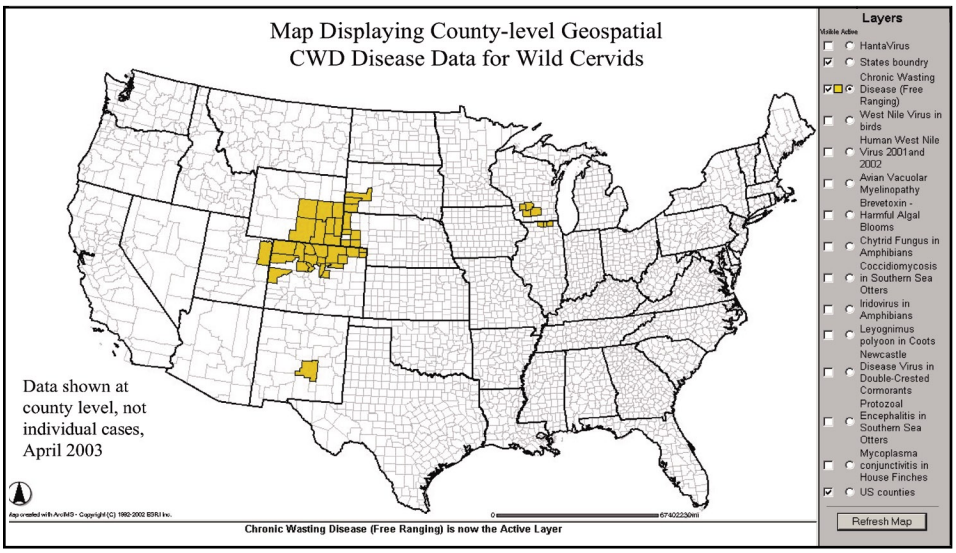
The management and sharing of scientific and technical information is critical to states, federal agencies, tribes, and other groups involved in CWD issues. Currently, no national system exists for common access to scientific, technical, and geospatial information on CWD, and there are many aspects of the disease for which information is very limited. As additional experience is gained, and surveillance and research results are obtained by the partners, they will all benefit by the presence of an active clearinghouse for CWD information from which nationwide trends can be analyzed, and informed management decisions made.

A Partnership for Sharing Information

The NBII Wildlife Disease Information Node offers an effective mechanism for providing access to comprehensive Internet-based CWD information in a secure, partner-based data system <http://wildlifedisease.nbii.gov>. A central data repository will allow many activities, including resource sharing and analyses. This collaborative effort will allow partners to use, from their own locations, a robust data entry and data visualization application, without the expense of creating individual stand-alone systems. Data security will be a priority, with partners determining the extent to which their data are available. The WDIN database was endorsed by state and federal representatives in the National CWD Implementation Plan as the common repository for scientific, technical, and geospatial CWD information.

While the WDIN will be initially housed at the USGS National Wildlife Health Center (NWHC) in Madison, WI, the node will be decentralized and eventually incorporate data holdings on geographically dispersed servers. The WDIN will provide the following capabilities:

- CWD information electronically accessible in near real-time
- Mapping capability for CWD test samples
- "One-stop shopping" for wildlife disease information



Screenshot of county-level geospatial CWD disease data for wild cervids; map available through the Wildlife Disease Information Node: <http://wildlifedisease.nbii.gov>.

- Shared mapping of wildlife diseases in the United States.

Goals of the Wildlife Disease Information Node for CWD

- Provide access to common scientific, technical, and geospatial CWD information in a secure, partner-based data system.
- Integrate contributed CWD information from state, federal, and tribal agencies, and others into the NBII Wildlife Disease Information Node.
- Work with states to create data standards that will allow the sharing of existing CWD data sets and provide confidentiality of data to providers as needed.
- Provide wildlife managers and disease specialists with access to CWD data and other information, including available test results, Geographic Information System (GIS) analyses of CWD patterns, and predicted areas of potential risk.
- Provide a database system that can be used by all agencies for their own local use, as well as a mechanism to contribute to a central repository for nationwide analyses.

Proposed WDIN Actions for CWD Data Integration and Information Management

Contributed CWD data will be collected through state and federal agency research, monitoring, and surveillance programs so that analyses can be shared on a regional and nationwide basis. Users will benefit from an integrated information system on all aspects of CWD and other relevant TSE information for CWD, including biology, diagnosis, and control issues. Proposed specific actions include:

- Establishing a robust database that can accommodate contributed testing results as well as research, monitoring, and surveillance data from state, federal, and tribal agencies. Representatives from states, tribes, and federal agencies will jointly develop standard data transfer and storage methods and a data access policy to ensure that ownership and proprietary issues are addressed. These critical issues will be discussed at a CWD data standards meeting conducted by the Conservation Management Institute and funded by a multi-state conservation grant from the International Association of Fish and Wildlife Agencies.

Photo credit: Christina Sigurdson, Colorado State University.

- Developing a system to allow state, federal, and tribal agencies to contribute current and archival data through direct Web access and file transfer. Consistent data collection and management procedures, and a certification and quality control system, will assure that only standardized and verifiable data are included in the NBII WDIN database.
- Distributing all subsets of data collected back to contributors in formats suitable for their needs.

Products

Partners will be able to contribute and access a wide range of information through the WDIN Web site, including:

- An integrated information system covering all aspects of the biology of CWD
- Direct online sample entry and geospatial visualization
- Geographic Queries - summarized CWD data from surveys at various geographic scales, down to the county level
- Online Mapping - relative density maps for CWD developed in "real time" through user-defined queries of the database.

Current Partners

Conservation Management Institute, Consortium for Conservation Medicine, National Park Service (St. Croix National Scenic Riverway), Southeastern Cooperative Wildlife Disease Study, University of Wisconsin-Division of Information Technology, U.S. Fish and Wildlife Service (Horicon National Wildlife Refuge), USGS Cartographic and Publishing Program, Wildlife Information Network, Wisconsin Division of Public Health, Wisconsin Department of Natural Resources, Wisconsin Veterinary Diagnostic Laboratory, and Yale University Occupational and Environmental Medicine Program.

For More Information

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